DOCUMENT RESUME

ED 057 297 AC 012 142

AUTHOR	McKee, John M.; Moon, Jeanne P.
TITLE	The Psychologist Consultant in Educational Design.
PUB DATE	3 Sep 71
NOTE	7p.; Paper presented at Meeting of American Psychological Association (Washington, D.C., September 3, 1971)
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Adult Basic Education; *Adult Vocational Education; Curriculum Design; *Educational Planning; Human Services; Individualized Instruction; *Instructional Systems; Learning Motivation; *Programed Instruction; Psychological Services
IDENTIFIERS	Individually Prescribed Instruction; IPI

ABSTRACT

The technology of educational design includes skills in solving performance problems, establishing training objectives, appropriate teaching strategies, course content, best teaching sequence(s), appropriate presentation mode, and type of feedback to give and when. A consulting psychologist can, through application of behavioral science, assist in the design, development, installation, and maintenance of educational products and training systems. The Individually Prescribed Instructional System (IPI) at Draper Correctional Center, which teaches basic education skills, as well as vocational skills, is an example of a training system developed and promoted by a psychologist. This system uses programmed instructional modules. In addition to the system's diagnosis, prescription, and management function, testing is conducted to evaluate the learner's progress. Contingency contracting is also used within the IPI system. The system can be tailored to a variety of settings containing different populations, and having varying amounts of resources. (DB)

U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

CO[illegible]Y COPY

ED057297

THE PSYCHOLOGIST CONSULTANT IN EDUCATIONAL DESIGN*

John M. McKee
Rehabilitation Research Foundation
Elmore, Alabama
and
Jeanne P. Moon
Spring Hill College
Mobile, Alabama

Scope of Educational Design

The field of educational design encompasses many functions and skills and is populated by many professions, including curriculum specialists, training directors, systems analysts, media specialists, and technical writers. In actual practice, educational design is the technology of achieving human performance objectives through efficient and effective training courses or systems. This technology includes the skills of determining a host of educational concerns:

- Performance problems
- Establishing training objectives
- Appropriate teaching strategies
- What content to include in the course and what *not to include*
- Best teaching sequence(s)
- Appropriate presentation mode
- What type of feedback to give the trainee and when

Educational design specialists are tackling problems that range from a comparatively simple instructional program to teach bank tellers to "balance a cage" to complex training systems for astronauts. Training problems about which much is said but little accomplished include teaching children and adults to read, training products of the ghetto in salable job skills and work habits, and teaching public offenders not to become recidivists.

These are the sorts of tough problems some psychologists are addressing themselves to in Manpower Development and Training Act programs, OEO projects, adult basic education, The Right to Read program, and others. Not that instructional hardware and materials, "systems," and "packages" don't abound. Whole clearinghouses have even been

*This paper was presented on September 3 at the 1971 meeting in Washington, D. C., of the American Psychological Association.

AC012142

set up to record and disseminate the plethora of instructional products. The honest fact is, however, a great deal of this material--the vital 'software that goes into the expensive but fascinating computer or teaching machine--is shoddy and unvalidated.

Enter the Psychologist Consultant

What can the consulting psychologist do about this dilemma in educational design and training? He can do much. If he is skilled in the application of behavior science he can force a full efficiency realization from the design, development, installation, and maintenance of educational products and training systems. It is basic to his preparation as a consultant in educational design that the psychologist learn how to recognize and construct well stated behavioral objectives for the training product or system.

But the consultant also needs the skill of evaluating instructional products by adhering to several essential criteria, derived from the behavioral laboratory. These criteria include the following:

1. Explicit behavioral objectives (terminal specifications) set forth in a manner which lends them to measurement.
2. Validation data provided by the publisher of the materials.
3. Active student participation--a feature that insures trainee involvement and helps to maintain interest in learning.
4. Instructional materials that provide the student with immediate feedback of his learning progress.

The consultant should also know how to employ recent developments in motivational technology, frequently referred to as *contingency management*. His knowledge should include a familiarity with such materials and techniques as the contingency contract, scheduling reinforcers, progress plotters, and other methods of feedback.

Other desirable background skills for the consultant in educational design would be those *any* consultant ought to have--how to promote, guide, teach, and win confidence of clients, school boards, business and industry. However, this paper will not address itself to these considerations; hopefully others on this panel will. How to train a person in these and related abilities, I leave to them.

On with the next step in the consultant's own training. My next recommendation is that he learn, firsthand, the nitty-gritty of carrying out an educational program. He should do this by getting directly involved in the operation of an educational system or program.

The basic understanding gained from personal experience will not only establish him as an expert in his field and enable him to instill the necessary confidence a client must have in the consultant and his product, but it will also afford him the knowledge to better implement staff training programs, a task very much in the domain of the educational designer. Staff training, of course, implies the need for training skills. The psychologist will significantly further his objectives by his ability in conference techniques, including sensitivity to group dynamics and tailoring the program, or product, or system to the particular setting in which he is consulting.

An Example of a Training System Developed and Promoted by a Psychologist in Educational Design

I wish now to become more concrete and to illustrate what I have been saying, though in rather general, descriptive terms. I shall describe a system that the consultant assisted in developing, that he worked *with* and *in* thoroughly, that he knew "how it worked," and that was the basis for his going out and consulting with others in order to train them to establish and tailor a similar system to their own particular setting. This training system teaches the student basic education skills. It is called an Individually Prescribed Instructional System, or IPI. It grew out of some of the earliest studies conducted at Draper Correctional Center by the Rehabilitation Research Foundation (RRF). These studies tested the feasibility of the use of programmed instructional (PI) materials in a correctional setting and found these materials to be considerably more successful with this particular disadvantaged population than the traditional lecture method. Many inmates had encountered nothing but failure in previous educational experiences. and were encouraged by the self-pacing and continual reinforcement offered by PI.

From the instructor's viewpoint, PI was a practical method for providing instruction for a class whose members were learning at a wide range of levels. In a class of fifteen, the range might be from third grade to first-year college. Using PI, instruction could also be given to individual members of the class studying within different subject areas–something difficult, at best, in the traditional classroom. The instructor became a learning manager, assigning various programs based on students' needs, rather than a teacher in the conventional sense. The PI method was applicable to vocational as well as to basic education skills, thus programmed lessons were developed in several vocational areas. In the barbering program, for example, the learner, through PI, gained knowledge of scissors

and clippers and various other tools and techniques of his intended occupation *before* he began actual observation and practice.

Refining the System

As useful as PI was, there existed, however, no systematic method of diagnosing and prescribing PI materials for specific learner deficiencies. For example, a learner might know everything about division of fractions except to invert before multiplying, but he would be required to study all material concerning division of fractions--or all material concerning fractions, depending upon the individual learning manager's skill in diagnosis. This repetition of mastered skills frequently caused the student's interest to flag and wasted his time.

Reacting to such inefficient learning, efforts were made to individualize programs by treating specific learner deficiencies with specific PI modules. This individually prescribed instruction (IPI) system retained all the positive features of the RRF's earlier use of PI while eliminating needless repetition. Based upon an item analysis of questions incorrectly answered on standardized achievement tests, a prescribing catalog was designed. This catalog made it possible for even the most inexperienced learning manager to prescribe the materials needed to remedy specific deficiencies, even indicating a priority order for the assignment of materials. The learning manager could then monitor the trainee throughout his learning experiences in the laboratory, providing him with feedback on his performance in the form of progress charts and conferences.

In addition to the diagnosis, prescription, and management functions of the IPI system, testing to evaluate the learner's progress is conducted as each prescribed module is completed. The learner must answer a certain percentage of the test questions correctly before he can begin work on the next assigned module.

Contingency contracting is also used within the IPI system. A performance contract, or contingency contract, is a written agreement between the learner and the learning manager stating the amount of work the learner is expected to successfully complete within a given time period. This time period is determined on the basis of the estimated time necessary to complete the specific modules. Each contract requires a progress test for each module, which must be completed with a certain percentage score.

In return for successful completion of a contract, certain reinforcers may be employed. Task completion and escape from the learning area have been found to be powerful reinforcers, as has money.

The IPI system and contingency contracting are used in both the basic education and vocational training programs of the RRF. The interest generated by their use has led to their adoption by other institutions for projects with different target groups.

Applying an Educational Design to Different Settings

One such project is now in operation at the Tuskegee Institute School of Nursing. The project is designed to reduce the high rate of attrition of nursing students by providing remedial and advanced academic programs in science, math, and language. The students chosen to participate are all entering freshmen who scored below the admission cutoff score on the entrance tests. The programmed materials prescribed to remedy their deficiencies are designed to supplement the regular classroom instruction of the Institute. Results to date have been very encouraging.

Another project is presently operating at Spring Hill College. Its purpose is to provide an intensive remedial and college preparatory program for deficient students, some of whom are already enrolled in college. The goal is to raise the grade-level achievement of the participating students to 12 grades and beyond in all areas measured by a standardized achievement test. IPI and contingency contracting are used both in the Spring Hill and Tuskegee projects.

IPI has come a long way from the early RRF studies in the use of PI. The system has recently been revised to incorporate newer and more effective PI materials, and greater sophistication is being continuously sought in diagnosing learner deficiencies. The versatility of the system lends itself very well to application in the world outside its correctional institution origin.

Evaluating the Program

The proper evaluation of this system required the answering of three entirely different questions:

1. Does the system effectively and efficiently teach the student the basic education skills it was designed to teach?
2. Do the staff training materials of the system effectively and efficiently teach the instructor or the "learning manager" the skills of establishing, operating, and evaluating the student's progress?
3. Can the system be installed in a variety of settings effectively?

With regard to the first question, validation data of two kinds are required:

1. Criterion-referenced measures. These are module tests within the system.

2. Norm-referenced measures or process performance measures. Pre- and posttest results on a standardized achievement test will provide these data.

The tabie below presents the validation data of the two types described above:

TABLE 1

Student Validation Results of IPI System

Subject	N	Module Test Average	TABE Pre	TABE Post	Grade Gain	Number Instructional Hours
Prison inmates	50	89	9.2	10.2	1.0	70
College students:						
Group I	27	93	10.5	11.5	1.0	78
Group II	17	91	9.5	10.5	1.0	40
Group III	36	90	9.9	10.6	.7	50

The second question raised, with regard to validation of the system--Do the staff training materials teach effectively and efficiently?--can be answered by looking at the following pre- and posttest results obtained from adult basic educators who used two of the programmed training lessons:

TABLE 2

Validation Results of Staff Training Lessons of IPI System (N = 87)

Programmed Lesson	Pretest	Posttest	Average Time Required	Range of Time Required
Introducing the IPI System	22%	91%	2 hours	35 minutes to 4 hours
Operating the IPI System	21%	98%	40 minutes	20 minutes to 2 hours

With regard to the third question--Can the system be tailored to a variety of settings, containing different populations, and having varying amounts of resources (facilities, funds, personnel, etc.)?--the answer is a conditional "yes." Variables that must be dealt with by the consultant and the on-site program administrator are as follows:

1. Objectives of the program: Vocational? Academic? Etc.
2. Characteristics of the student population: Age? Degree of literacy? Institutionalized? Length of time student will be in program? Etc.
3. Funding level of program
4. Existing resources: Number and skill or educational level of staff? Amount of space? Amount and kind of audiovisual equipment and instructional materials?
5. Availability of educational design consultant for technical follow-up
6. Commitment level of program administrator and staff to system

Summary Conclusion

The psychologist consultant in educational design is not an educational consultant *per se*. The psychologist differs from the latter in what makes him unique. He is essentially a behavioral engineer, or contingency manager, a practitioner who can apply learning principles to the design of training materials, educational media, and teaching strategies. With his background in behavioral science, he knows how to evaluate the training system to determine its effectiveness. When brought in by an agency or company to consult on an educational program in operation, perhaps one with which he is unfamiliar, he can effectively assess the system by asking the right kind of questions, those that request data; he can improve upon the system by applying his knowledge of learning theory; and he can competently direct the redesign of its dysfunctional components.

A good future exists for the skilled psychologist in educational design. He is unique in the field of education by virtue of his background and experience. His star is just starting its ascent--we'll hear much more from him.

ERIC Clearinghouse
DEC 16 1971
on Adult Education